



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,115	12/15/2003	Fujio Ito	501.37400CV4	4854
20457	7590	11/14/2005	EXAMINER	
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873			CHAMBLISS, ALONZO	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 11/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/734,115

Applicant(s)

ITO ET AL.

Examiner

Alonzo Chambliss

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 October 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-9 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 15 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☒ Certified copies of the priority documents have been received in Application No. 09/369,402.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. The amendment filed on 10/24/05 has been fully considered and made of record in the instant application.

### ***Terminal Disclaimer***

2. The terminal disclaimer filed on 10/24/05 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of US patent 6,803,258 has been reviewed and is accepted. The terminal disclaimer has been recorded.

### ***Response to Arguments***

3. Applicant's arguments filed 10/24/05 have been fully considered but they are not persuasive.

Applicant alleges that the combination of Mars (US 5,701,034), Yasuhara (US 5,150,193) and Yamauchi (JP 1-309359) fail to disclose the second portion of the plate used as an anchor for the tips of the leads during the bonding. Mars discloses fastening the tips of leads 102a on the second portion of the plate and after step (e), bonding wires 114 on the tips 102a of the leads 102 and the electrodes 115 of the semiconductor chip 101 to electrically connect to each other using the second portion of the plate as an anchor for the tips of the leads during the bonding (see Fig. 4, 6A, 6B, 7, and 8). Therefore, the non-final rejection is maintained and this action is made **final**.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1–7 and 9, insofar as definite, are rejected under 35 U.S.C. 103(a) as being unpatentable over Marrs (US 5,701,034) in view of Yasuhara (US 5,150,193) and Yamauchi (JP 1-309359).

With respect to Claims 1 and 3, Marrs discloses preparing a plurality of leads made of a plate material (see Figs. 2B, 7, and 8) and it is well known in the semiconductor industry that leads are inside lead frame having a framework as evident by Yasuhara (see Figs. 3, 8, 17a, and 17b). Preparing a plate 110 (i.e. plate material) including a main surface and a back surface opposite to the main surface, wherein plate 110 having a first portion of the main surface and a second portion of the main surface

that is at the outer periphery of the first portion. Preparing a semiconductor chip 101 having a semiconductor element and a plurality of electrodes 115 (i.e. pads) formed on a principal plane. Fastening the semiconductor chip 101 on the first portion of the plate 110. Fastening the tips of leads 102a on the second portion of the plate and after step (e), bonding wires 114 on the tips 102a of the leads 102 and the electrodes 115 of the semiconductor chip 101 to electrically connect to each other using the second portion of the plate as an anchor for the tips of the leads during the bonding (see Fig. 4). After step (f), sealing the tips 102a of the leads 102, the plate 110, the semiconductor chip 101 and the bonding wires 114 with a molding member 120 (see col. 5 lines 1-33; Figs. 1, 2A, 4, 7, and 8). Marrs fails to disclose wherein the lead have the width of tips of the leads are smaller than the lead thickness of the tips of the leads. However, Yamauchi discloses wherein the leads 2 have the width of tips of the leads are smaller than the lead thickness of the tips of the leads 2 (see English abstract and Figs. 1 and 2). Thus, Marrs and Yamauchi have substantially the same environment of a chip electrically connected to a lead, wherein the chip and portion of the leads are encapsulated. Therefore, one skilled in the art at the time of the invention would readily recognize substituting leads with a width smaller than the thickness of the leads for the leads taught by Marrs, since the leads with the smaller width would occupy a smaller space on the substrate while preventing adjacent leads from contacting one another as taught by Yamauchi.

With respect to Claim 2, Marrs discloses the tips of the lead are separated from each other (see Figs. 2B, 3B-3F, 6A, 6B, and 7).

With respect to Claim 4, Marrs discloses wherein the plate material includes a metal plate 110 and the tips of the plurality of leads 102a are electrically isolated from the metal plate by the dielectric layers 206, 208 (see col. 5 lines 59-67 and col. 6 lines 1-15; Figs. 2A and 2B).

With respect to Claim 5, it is well known in the semiconductor industry that bonding wires are made of gold as evident by Yasuhara (see col. 7 lines 16-19).

With respect to Claim 6, Yasuhara discloses wherein the plate material has slits 221 – 224 penetrating the plate material in a thickness direction thereof, wherein the slits 221 – 224 extend closer to the chip mounting area than the tips of the plurality of leads, and wherein the step (b) is performed such that the semiconductor chip 21, 112, is mounted to partially overlap the slits in a plane view (see col. 21 lines 9-29; Figs. 1, 12, 17A, and 17B).

With respect to Claim 7, Yasuhara discloses wherein the plurality of leads of the lead frame is formed by etching (see col. 13 lines 57-60).

With respect to Claim 9, Yasuhara discloses wherein the plurality of leads and the plate material are made of copper (see col. 2 lines 57-61).

6. Claim 8, insofar as definite, is rejected under 35 U.S.C. 103(a) as being unpatentable over Marrs (US 5,701,034), Yasuhara (US 5,150,193), and Yamauchi (JP 1-309359) as applied to claim 3 above, and further in view of Yamada (US 5,939,774).

With respect to Claim 8, Marrs, Yasuhara, and Yamuchi all fail to disclose wherein the width of each of the plurality of leads is less than 180 um. However, Yamada discloses the width of each of the plurality of leads is less than 180

micrometers as evident by Yamada (see col. 6 lines 56-62). Thus, Marrs, Yasuhara, Yamuchi, and Yamada have substantially the same environment of a lead frame partially encapsulated that is electrically attached to a semiconductor chip. Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate a plurality of leads having a width of less than 180 micrometers with the process of Marrs, Yasuhara, Yamuchi, since the leads would facilitate connection for miniaturized semiconductor package while increasing the number of pin connection to the substrate as taught by Yamada.

The prior art made of record and not relied upon is cited primarily to show the process of the instant invention.

### Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2814


the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (571) 272-1927.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system Status information for published applications may be obtained from either Private PMR or Public PMR. Status information for unpublished applications is available through Private PMR only. For more information about the PMR system see <http://pair-dkect.uspto.gov>. Should you have questions on access to the Private PMR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or [EBC\\_Support@uspto.gov](mailto:EBC_Support@uspto.gov).

AC/November 8, 2005

A handwritten signature in black ink, appearing to read 'Alonzo Chambliss', with a stylized flourish at the end.

Alonzo Chambliss  
Primary Patent Examiner  
Art Unit 2814